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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,812	12/04/2001	Mostafa Ronaghi	A34454-PCT-USA	8861

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EXAMINER

CHAKRABARTI, ARUN K

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 02/14/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/889,812

Applicant(s)
Ronaghi

Examiner
Arun Chakrabarti

Art Unit
1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/04/01 and 6/11/02 and
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 11-15 is/are rejected.
- 7) ☒ Claim(s) 5-10 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 7 6) ☒ Other: *Detailed Action*

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DETAILED ACTION

Specification

1. Claims 5-10 are objected to under 37 CFR 1.75© as being in improper form because a multiple dependent claim 5 cannot depend on another multiple dependent claim 4. See MPEP § 608.01(n). Accordingly, the claims 5-10 have not been further treated on the merits.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-4 and 11-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11-14 provide for the use of a single-stranded nucleic acid binding protein in a nucleic acid sequencing-by-synthesis method, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

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Claims 11-14 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is rejected as indefinite because the instantly claimed methods lacks final process steps that clearly relates back to the preamble. For the method of claim 1, the preamble of the instantly claimed method is drawn to a method for identifying a base at a target position while the final process step is that of detecting incorporation and it is thus unclear as to whether the instantly claimed method is drawn to a process for identifying a base at a target position or rather detecting incorporation. Method claim requires a last step or phrase in the last step that states the accomplishments of the goals for the method which were stated in the method's preamble. Claim 1 lacks such a last step and is confusing because the additional method step is not sufficiently set forth. While minute details are not required in method claims, at least the basic steps must be recited in a positive, active fashions. See *Ex parte Erlich*, 3 USPQ2d1011, p.1011 (Bd. Pat. Applicant. Int. 1986). It is suggested that an amended claim more clearly describing the intended steps be submitted.

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It is also not clear from claim 1 if incorporation of nucleotide precedes detection or detection precedes nucleotide incorporation. The metes and bounds of the claim is vague and indefinite.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4 are rejected under 35 U.S.C. 102 (b) as being anticipated by Studier et al. (U.S. Patent 5,547,843) (August 20, 1996).

Studier et al. teach a method of identifying a base at a target position in a sample nucleic acid (DNA) sequence wherein a primer, which hybridizes to the sample nucleic acid immediately adjacent to the target position, is provided and the sample nucleic acid primer are subjected to a polymerase reaction in the presence of a nucleotide whereby the nucleotide will only become incorporated if it is complementary to the base in target position, and the incorporation is detected, characterized in that, a single-stranded nucleic acid binding protein Eco SSB is included in the polymerase reaction step (Abstract, Column 3, line 26 to column 6, line 21 and Figure 1 and Table 1).

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Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 12-14 are rejected under 35 U.S.C. 103 (a) over Uhlen et al. (PCT International Publication Number: WO 93/23564) (November 25, 1993) in view of Chou (Nucleic Acids Research, (1992), Vol. 20 (6), page 4371).

Uhlen et al teach a method of enhancing the activity of nucleotide degrading enzyme and luciferase and maintaining a constant signal intensity (Abstract and Claim 1 and Page 17, line 25 to page 20, line 26 and Table 1).

Uhlen et al do not teach the method wherein a single-stranded nucleic acid binding protein Eco SSB is included in the sequencing-by-synthesis method.

Chou teaches the method wherein a single-stranded nucleic acid binding protein Eco SSB is included in the sequencing-by-synthesis method (page 4371, column 1, second paragraph and Figure 1).

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to substitute and combine the method wherein a single-stranded nucleic acid binding protein Eco SSB is included in the sequencing-by-synthesis method of Chou with the method of enhancing the activity of nucleotide degrading enzyme and luciferase and maintaining a

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constant signal intensity of Uhlen et al ., since Chou states, “Either EcoSSB improves Taq DNA polymerase processivity, or EcoSSB melts PCR target secondary structure during PCR, allowing Taq polymerase read through (page 4371, column 1, second paragraph, last sentence)”. An ordinary artisan would have been motivated by these express statements of Chou to substitute and combine the method wherein a single-stranded nucleic acid binding protein Eco SSB is included in the sequencing-by-synthesis method of Chou with the method of enhancing the activity of nucleotide degrading enzyme and luciferase and maintaining a constant signal intensity of Uhlen et al., in order to achieve the express advantages of EcoSSB, as noted by Chou , which improves Taq DNA polymerase processivity, or melts PCR target secondary structure during PCR, allowing Taq polymerase read through.

8. Claim 15 is rejected under 35 U.S.C 103 (a) over Studier et al. (U.S. Patent 5,547,843) (August 20, 1996) in view of Stratagene Catalog (1988, Page 39).

Studier et al. expressly teach the method claims 1-4 as described above in detail.

Studier et al. et al do not teach the motivation to combine all the reagents including Eco SSB for sequencing by amplification of a nucleic acid in the form of a kit.

Stratagene catalog teaches a motivation to combine reagents into kit format (page 39).

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine a suitable container and all the reagents including Eco SSB for sequencing by amplification of a nucleic acid of Studier et al, into a kit format as discussed by Stratagene catalog since the Stratagene catalog teaches a motivation for combining reagents of

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use in an assay into a kit, "Each kit provides two services: 1) a variety of different reagents have been assembled and pre-mixed specifically for a defined set of experiments. Thus one need not purchase gram quantities of 10 different reagents, each of which is needed in only microgram amounts, when beginning a series of experiments. When one considers all of the unused chemicals that typically accumulate in weighing rooms, desiccators, and freezers, one quickly realizes that it is actually far more expensive for a small number of users to prepare most buffer solutions from the basic reagents. Stratagene provides only the quantities you will actually need, premixed and tested. In actuality, the kit format saves money and resources for everyone by dramatically reducing waste. 2) The other service provided in a kit is quality control". (page 39, column 1).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arun Chakrabarti, Ph.D., whose telephone number is (703) 306-5818. The examiner can normally be reached on 7:00 AM-4:30 PM from Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion, can be reached on (703) 308-1119. The fax phone number for this Group is (703) 305-7401.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group analyst Chantae Dessau whose telephone number is (703) 605-1237.

Arun Chakrabarti,

Patent Examiner,

February 11, 2003

Arun K. Chakrabarti
ARUNK. CHAKRABARTI
PATENT EXAMINER